

BLIND SOURCE SEPARATION OF PULSE OXIMETRY SIGNALS

ABSTRACT OF THE DISCLOSURE

A method and apparatus for the application of Blind Source Separation (BSS), specifically independent Component Analysis (ICA) to mixture signals obtained by a pulse oximeter sensor. In pulse oximetry, the signals measured at different wavelengths represent the mixture signals, while the plethysmographic signal, motion artifact, respiratory artifact and instrumental noise represent the source components. The BSS is carried out by a two-step method including an ICA. In the first step, the method uses Principal Component Analysis (PCA) as a preprocessing step, and the Principal Components are then used to derive sat and the Independent Components, where the Independent Components are determined in a second step. In one embodiment, the independent components are obtained by high-order decorrelation of the principal components, achieved by maximizing the sum of the squares of the higher-order cumulants of the plurality of mixture signals.